

New File - Peerless Chain



SANITARY ENGINEERING LABORATORIES, INC.  
3105 E. 42nd St., Minneapolis, Mn. 55406 (612) 722-6661

November 8, 1972

GERALD ALLEN, PE.  
LAWRENCE BREIMHURST, PE.

US EPA RECORDS CENTER REGION 5



410014

Mr. Harry E. McCarthy  
Metallurgist  
Peerless Chain Company  
Winona, Minnesota 55987

Dear Mr. McCarthy:

Three copies of our report of laboratory analysis for the waste sludge sample received on September 11, 1972, are enclosed. I apologize for the error in sending you the wrong first sheet. I hope that this has not caused you any undue problems.

I discussed the possibility of suspended sulfate and chloride particles passing through the apparatus rather than dissolved sulfates or chlorides as reported. Keith indicates that about 1½ inches of lightly packed glass wool was placed in the tube below the sample. We also passed some of the sample through a membrane filter today. The results indicate that the sulfate contained in the filtrate is dissolved. All of the sulfate passed through the .45 micron-filter. Therefore, it can be assumed that these materials were in fact leached from the material.

If you have any questions or comments concerning this report, feel free to contact us at any time.

Yours truly,

SERCO LABORATORIES

Gerald S. Allen, P. E.

GSA/ct

Enclosures

1 copy to J.F. 11/10/72



PROVIDING A SANITARY ENGINEERING RESEARCH AND LABORATORY SERVICE TO  
INDUSTRY, MUNICIPALITIES AND CONSULTING ENGINEERS



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REPORT OF LABORATORY ANALYSIS  
WASTE SLUDGE LEACHING STUDY  
PEERLESS CHAIN COMPANY  
SEPTEMBER, 1972

The following is a report of laboratory study of a waste sludge sample received by SERCO Laboratories on September 11, 1972

According to information provided by company personnel the untreated wastes are collected from several steel cleaning operations. These raw chemicals are used:

1. Sulfuric acid
2. Muriatic acid
3. Chromic acid

The principal dissolved metals are ferrous and ferric iron, zinc and hexavalent and trivalent chromium. Any other metals present would be trace contaminants.

The waste was treated with a slurry of hydrated lime to a pH of 8, by Peerless Chain personnel. The sludge resulting from lime treatment was mixed with Portlant cement and waterglass. It was air dried for 16-hours. A bag sample marked 9/7-1 was sent to SERCO for examination and detection of the possibility of leaching materials from the sludge.

The results of this analysis is categorized into three samples. A sample of the waste sludge (6.7 grams dry weight) was packed into a 12-inch by 3/8-inch glass tube shown in Figure I. The glass tube was inserted into a two hole stopper and placed on a five-gallon plastic bottle. A funnel was placed on the top of the tube for ease in pouring the distilled water into the column. The funnel was also used to catch the rain water.

Distilled water was then filtered through the packed column until a representative amount of water was obtained in the plastic bottle. This sample was designated as "LAB". The same distilled water that remained and had not passed through the sludge was analyzed and the results are identified as "DISTILLED". This second sample provides a comparison of the distilled water before and after it passes through the filter. The column was then cleaned thoroughly and a new sample added in the same proportion as that initially tested. The unit was then subject to outdoor weather identified as "FIELD".



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The results of the analysis shown in the Table, indicate that some leaching of chemicals does occur. However, the potentially toxic material ions do not leach from the sludge mixture. The results of the field test are limited to weather conditions that occur at SERCO Laboratories located in Minneapolis and may not be the same as that occurring in Winona.

Based upon the results of this study, treated waste sludge like that contained in the sample that we received, can be disposed of in a properly operated land disposal facility without danger of toxic material leaching from the sludge by normal rain and runoff water. However, if other material is disposed of with this sludge so that an acid condition might occur in the landfill, the metal ions may be leached from the sludge.

The laboratory results were performed in accordance with methods described in Standard Methods for the Examination of Water and Wastewater, 13th Edition.

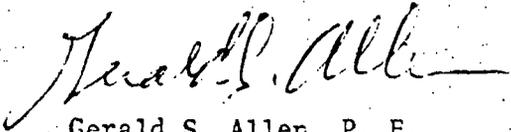
The laboratory analysis and preparations of this report, were performed either by myself or under my direct supervision.

Submitted by,

SERCO LABORATORIES

  
Keith M. Hoffmann, Chemist

Approved by:



Gerald S. Allen, P. E.  
Minn. Engr. Reg. No. 7033

October 16, 1972

TABLE OF LABORATORY ANALYSIS  
 SLUDGE WASTE SAMPLE  
 PEERLESS CHAIN COMPANY  
 WINONA, MINNESOTA  
 SEPTEMBER, 1972

Analysis	LAB.		FIELD		DISTILLED
	mg/l	mg/g	mg/l	mg/g	mg/l
Iron, mg/l as Fe	* <0.05	* <0.007	* <0.05	* <0.007	* <0.05
Zinc, mg/l as Zn	* <0.005	* <0.001	* <0.005	* <0.001	* <0.005
Mercury, mg/l as Pb	* <0.001	* <0.001	* <0.001	* <0.001	* <0.001
Total Chromium, mg/l as Cr	* <0.025	* <0.004	* <0.025	* <0.004	* <0.025
Hexavalent Chromium, mg/l Cr	* <0.005	* <0.001	* <0.005	* <0.001	* <0.005
Sulfate, mg/l as SO <sub>4</sub>	1300	193	900	134	* < 5
Chlorides, mg/l as Cl	175	27	199	29	* < 1
Alkalinity, mg/l as CaCO <sub>3</sub>	28	4.2	28	4.2	18
Specific Conductance, umho @ 25°C	2500	375	2300	345	40
Sodium, mg/l as Na	18	2.7	22	3.3	* <0.10
Silicate, mg/l as SiO <sub>2</sub>	10.5	1.6	6.5	0.9	* <0.20
pH	8.20	-	8.10	-	8.70
Total Solids, mg/l	2575	385	2440	360	30
Calcium Hardness, mg/l as CaCO <sub>3</sub>	1620	245	1620	245	24
Total Hardness, mg/l as CaCO <sub>3</sub>	1640	250	1640	250	16

\* <Means "less than"

October 16, 1972

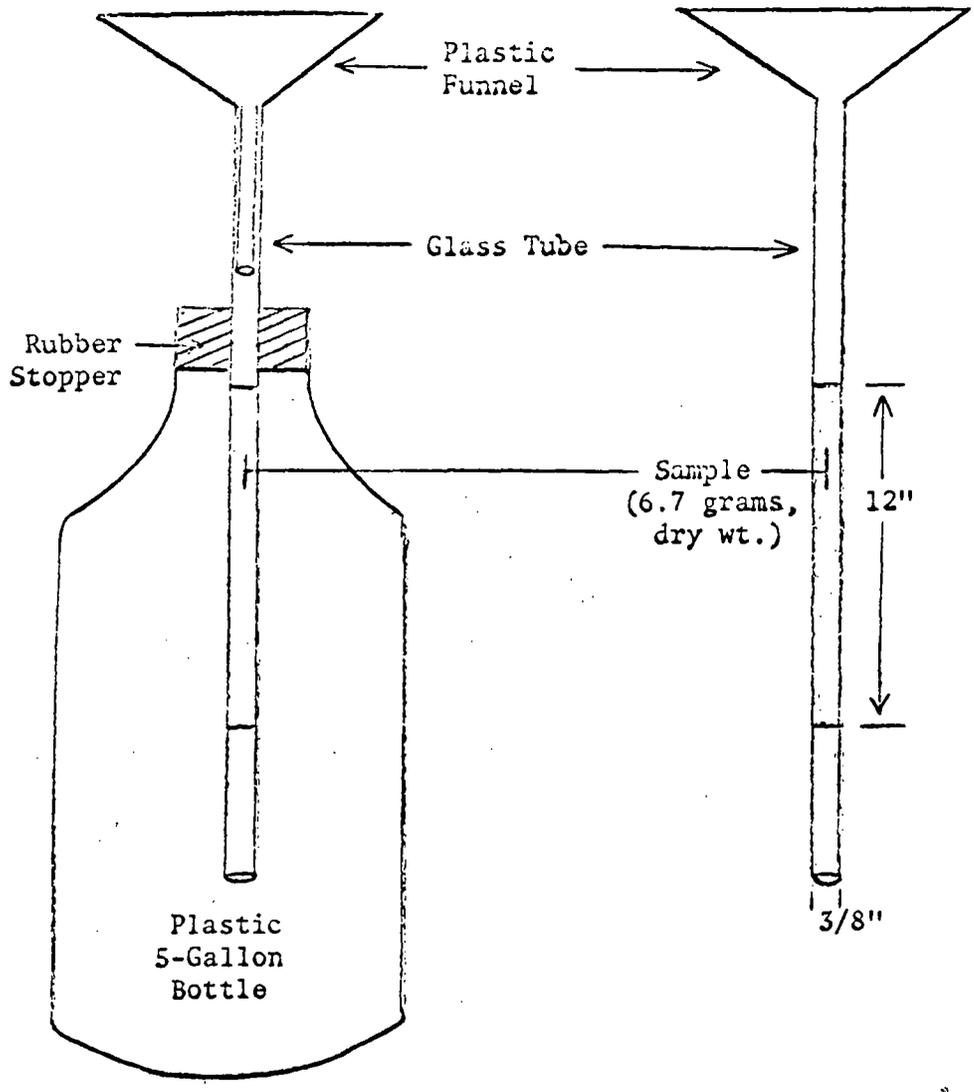


FIGURE I

PEERLESS CHAIN COMPANY  
WASTE SLUDGE LEACHING STUDY  
SERCO LABORATORIES      OCTOBER, 1972